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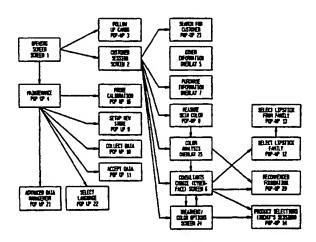
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[Continued on next page]

(54) Title: A SYSTEM FOR COLOUR COSMETIC SELECTION



(57) Abstract: A method and system is provided for selecting a facial colour cosmetic scheme. Apparatus employed for the system includes a computer module with a colour monitor screen, a spectrophotometer for measuring a customer's skin colour and a device for transferring the measured colour information from the spectrophotometer to the computer module for entry into a program allowing visualisation of a model face with skin colour matched to that of the customer. The method includes measuring via spectrophotometer a customer's facial colour, transmitting information on that colour to the module for display on the model face appearing in the monitor, allowing the customer to select at least one colour for an area of the face to be covered by a cosmetic product, and then displaying the visualised model face with the selected colour. The system and method allow a customer to visualise the colour combination without the necessity of using the actual colour cosmetic on their own face for evaluation purposes.

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IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, For two-letter codes and other abbreviations, refer to the "Guid-Cl. CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

ance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- With international search report.

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A SYSTEM FOR COLOUR COSMETIC SELECTION

Field of the Invention

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The present invention relates to a method and implementing apparatus for assisting a customer in selecting colour cosmetic products.

10 BACKGROUND OF THE INVENTION & PRIOR ART

Colour cosmetics are highly personal to an individual. An optimum shade is selected having relevance to a customer's skin coloration and to a colour fancied by the customer.

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- Assistance in the selection of an optimal colour shade is available to help the consumer. Clinque and Clarion have installed computers at sales counters for use by customers. Information on colour, shade, oiliness and other properties of a customer's skin are punched into the computer which then determines the company's most closely matching product. Two major companies, Prescriptives (Division of Estee Lauder) and Visage (Division of Revlon) have for some time practiced a manual system for evaluating a subject's skin colour. The sales person is trained through the use of match cards to identify a user's matching skin foundation. Unfortunately manual systems suffer from poor reproducibility. Extensive training must also be invested in a sales person.
- 30 German patent 41 10 299 C1 (Erdtmann) discloses the use of a facial sensor for reading skin property values and then utilising the measured values in selecting an optimum skin product. Subsequently, the information is sent to an automatic cosmetic

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dispensing system for blending selected additives to formulate the selected product.

U.S. Patent 5,622,692 (Rigg et al.) reports a system for customising a facial foundation product at point of sale to a customer. Three essential elements are present. They include a skin analyser for reading skin properties, a programmable device receiving the reading and correlating it with an optimal formula and a formulation machine for preparing the facial foundation product from various cosmetic chemical compositions. Technology described in this patent has commercially been embodied in Elizabeth Arden's Custom Colour system available for many years in major department stores.

15 Arden's system has been a significant advance in the art. However, it suffers from certain deficiencies, including the inability of customers to evaluate different colour cosmetics in the context of their own skin colouration, and in juxtaposition to combinations of different facial makeover products. Thus it would be desirable to have visualised a lipstick and a foundation, eye shadow and/or blush on a colour interactive basis. Especially desirable would be to evaluate the interaction of the various colour cosmetics without actually having to place these on one's own face.

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Accordingly, it is an advantage of the present invention to provide a system and apparatus for selecting a facial colour cosmetic scheme from a palette of different shades and makeup products without requiring the actual placement of these products on the customer's face.

Another advantage of the present invention is to provide a system and apparatus for selecting a facial colour cosmetic scheme allowing rapid visualisation of different coloured makeup

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permutations on various areas of the face in a simultaneous manner.

SUMMARY OF THE INVENTION

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The present invention provides a method for selecting a facial cosmetic colour scheme, the method including:

- (i) providing a computer module including a color monitor screen and a spectrophotometer;
- (ii) measuring a customer's facial colour with the spectrophotometer;
 - (iii) transmitting information on the measured facial colour to the computer module for display of that colour on a model face generated on the monitor screen;
 - (iv) allowing the customer to select at least one area of the face to be coloured with a colour cosmetic product; and
- (v) colouring the area of the model face with the 20 selected colour.

Optionally, a further step may be added involving printing on paper the coloured display from step (v) appearing on the monitor. By this method, a customer can select eye shadow, eye liner, lipstick, lip liner, blush, foundation and/or powder with selected colours, at least some of the combination having been first evaluated on a model face generated on the computer monitor screen. A program controlling the colour and selection scheme can further be included to correlate a vendor's products which will achieve the selected colour palette.

According to a further aspect, the present invention provides a system for selecting a facial colour cosmetic scheme, the system including:

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- (i) a computer module connected with a colour monitor screen;
- (ii) a spectrophotometer for measuring skin colour;
- (iii) a mechanism for transfer of facial colour data obtained from measurements with the spectrometer over to the computer module and transmission onto the monitor screen; and
- (iv) an interactive program displayed on the monitor allowing the customer to select at least one colour for application to an area of a model face appearing on the monitor.

BRIEF DESCRIPTION OF THE DRAWINGS

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- 15 The various objects, features and advantages of the present invention will become more readily apparent from consideration of the following drawing in which:
- Fig. 1 shows a flow chart diagramming a program used in the system of the invention for selecting facial colour cosmetic schemes;
 - Fig. 2 shows Screen 2 of the program;
- 25 Fig. 3 shows Pop-Up Screen 3 of the program;
 - Fig. 4 shows Pop-Up Screen 4 of the program;
 - Fig. 5 shows Overlay 5 of the program;

Fig. 6 shows Screen 6 of the program;

Fig. 7 shows Overlay 7 of the program;

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	F.	ig. 8	8 s	hows	Pop-Up	Screen (8 of	the	pr	ogram.	;		
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5	F	ig.	10	shows	Pop-Up	Screen	10 c	of t	he	progra	am;		
	F	ig.	11	shows	Pop-Up	Screen	11 0	of t	he	progra	em;		
LO	F	ig.	12	shows	Pop-Up	Screen	12 c	of t	he	progra	; me		
	F	ig.	13	shows	Pop-Up	Screen	13 c	of t	he	progra	am;		
	F	ig.	14	shows	Pop-Up	Screen	14 c	of t	he	progra	am;		
15	F	ig.	15	shows	Overla	y Scree	n 15	of	the	prog	ram;		
	F	ig.	16	shows	Pop-Up	Screen	1 _. 6 t	hro	ugh	19 o:	f the	progra	am;
20	F	ig.	17	shows	Pop-Up	Screen	20 c	of t	he	progra	am;		
20	F	ig.	18	shows	Pop-Up	Screen	21 0	of t	he	progra	; me		
	F	ig.	19	shows	Pop-Up	Screen	22 0	of t	he	progra	am;		
25	F	ig.	20	shows	Pop-Up	Screen	23 0	of t	he	progra	am;		
	F	ig.	21	shows	Screen	24 of	the p	prog	ram	;			
30	F	Fig.	22	shows	Overla	y 25 of	the	pro	gra	m; and	đ		
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•						ethod a		_			-		
	includ	ing	re	commer	ndation	for va	iriou	s d	ultf	erent	type	s of	colour

cosmetics.

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DETAILED DESCRIPTION OF THE INVENTION

Now it has been found that a customer can evaluate how different colour cosmetics can interact by first visualising different colours on different areas of the face through computerised painting of a model face upon a monitor screen. In this system a customer is allowed to select colours to be placed on different areas of the model face. A reiterative procedure then occurs. This involves the customer selecting a colour, having the program paint the selected colour onto the stylised model face and then allowing the customer to evaluate the result. No longer must a customer actually try the product on his or her own face. A very rapid and clean evaluation can occur through use of the visualised model face.

A customer's actual facial colour can be measured by spectrophotometer/colorimeter of a type having a visible light source, such as light emitting diodes (LED), xenon-arc, tungstenhalogen and similar type in the wavelength range of 400-900 nm. The visible light source may form the sensor portion of the spectrophotometer/colorimeter. visible and infrared Both wavelength light may be utilised in connection with the sensor Suitable skin analysers are commercially available from Minolta Camera Co. Ltd., Japan and from Colortec Associates. Actual skin colour normally is measured around neckline areas which are free of a customer's foundation or other cover-up cosmetics.

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Measurement starts by cleaning the areas preparatory to a reading.

The spectrophotometer/colorimeter is then placed in proximity to the cleaned facial area. Visible light emitted in the 400-900 nm range by the device will be reflected off the skin surface and the

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reflective wavelength measured. It is recommended that at least five skin readings along the neck/jaw line region be taken. time for the reading requires approximately 30 seconds. A cable connecting the spectrophotometer/colorimeter to the computer module transmits the measured information on L, a and b thereby inputting a customer's natural skin colour parameters into the database. Alternatively the measured values can be read by the consultant directly off of the measuring spectrophotometer/colorimeter and manually banked computer module by typing the information on a linked keyboard.

By the term "computer module" is meant any programmable device capable of processing information. Normally these are personal computers.

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Fig. 1 is a flow chart of a program according to one embodiment of this invention. After the opening screen, a user is introduced to Screen 2 known as the 'customer session'. Client information is obtained via this screen through either a swipe card, entry via a keyboard or from a database. The screen remains active (buttons are available) when overlays are displayed. Fig. 1 provides a view of Screen 2.

A Pop-up Screen 3 next appears with comments and client information to prompt follow-up calls. This screen can be used for contacting the client to remind them to visit the store when their cosmetic supply may be low. Fig. 3 illustrates the screen.

Pop-up Screen 4 covering 'Maintenance' is then available for 30 appearance. This pop-up screen has options for calibration and data handling. Fig. 4 sets forth the screen.

Other information is collected with Overlay Screen 5. The Overlay screen selects/changes information about skin, beauty habits, type

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and brand of products used. Overlay Screens 2 and the buttons on Screen 2 remain active. Fig. 5 describes Overlay Screen 5.

Screen 6 provides a 'Consultant's Choice'. This screen shows 5 effects of colour palette, using client's skin Information on the client's skin colour is obtained through application of a hand-held spectrophotometer against areas of the face not likely to be covered by makeup. These areas include the The cosmetic 'look' can either be neck and under chin areas. 10 based on skin colour (skin recommendation), lipstick colour (colour family), or a specific look. Depending on selections, a list of typically five 'looks' is created, and selecting (another look) displays next look in the series. Fig. 6 sets forth Screen 6.

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Purchase information is achieved in Overlay Screen 7. This screen with previous and current purchase information (overlay to screen 2) is ordered by visit date. It contains information from up to the last five visits. Purchase information includes number, product type, product name and product number. Fig. 7 sets forth the purchase information screen.

Pop-up Screen 8 measures skin colour. It consists of a series of screens to assist an adviser with colour measurement. This session is repeated three times. Fig. 8 depicts the Pop-up Screen 8.

Pop-up Screen 9 serves to obtain information for a new store. It is used by the installation team to correctly set up the storespecific parameters. Fig. 9 describes the Pop-up Screen 9.

Collection of data for the main office is found in Pop-up Screen 10. Data is placed in a store's outbox, and can then be transferred in three ways. These include: (1) remote computer can

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dial in and retrieve file from outbox; (2) transfer information to a server automatically using PC-anywhere script; and/or (3) copied to floppy disk and mailed to central site. Fig. 10 illustrates the Pop-up Screen 10.

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Pop-up Screen 11 copies data from other stores. It can accept data in two ways. These include: (1) update using floppy supply by the main office; or (2) use of PC/Anywhere script to retrieve update file from main office outbox. Fig. 11 illustrates the Pop-up Screen 11.

Pop-up Screen 12 allows selection of a colour lipstick family. The customer advisor can either enter a specific lipstick number, or choose a colour family, then choose a colour from the family. The active colour palette will consist of individual palettes that

The active colour palette will consist of individual palettes that contain that lipstick. The advisor can also enter a specific look (can be either from a previous visit or any of the available looks in the palette). Fig. 12 describes the pop-up Screen 12.

20 Pop-up Screen 13 allows selection of lipstick from a colour family (as selected from Pop-up Screen 12). If the lipstick is also in the palette recommendation based on skin tone, the colour is put first in the list, and (expert fit) is added to the name. Fig. 13

describes the Pop-up Screen 13.

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Pop-up 14 shows product selections (treatments in cosmetic colours) made during the present session. Product selections can be made during colour viewing (Screen 6), treatment/product options (Overlay 24) or Recommended Foundation (Pop-up Screen 20). There also is a display of recommended looks. Fig. 14 describes

the Pop-up Screen 14.

Overlay Screen 15 is used to provide a snapshot of the type of customer. For detail purchase history, Overlay 7 provides the

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purchase information. Included in this screen are key purchase properties, group by type, over the past twelve months. It is automatically displayed for each customer. Fig. 15 lists the Overlay Screen 15.

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Pop-up Screen 16 is a probe for calibration/routine and for messages to calibrate probe. Fig. 16 details the Pop-up Screens 16-19.

- 10 Pop-up Screen 20 is used to recommend the best foundation product combination based on skin colour and product preferences. Fig. 17 details the Pop-up Screen 20.
- Pop-up Screen 21 is an advanced data management module. This is used by the main office. Fig. 18 details the Pop-up Screen 21.
 - Pop-up Screen 22 relates to language selection. Fig. 19 details Pop-up Screen 22.
- 20 Pop-up Screen 23 is used to locate and activate a client. If this is a new client, the 'new' button is clicked to create the new client file. Fig. 20 details Pop-up Screen 23.
- Screen 24 details treatment/colour/fragrance options showing all the option products. Fig. 21 details Screen 24.
 - Overlay 25 focuses on skin colour analysis allowing selection of shade and tone. Fig. 22 details the Overlay 25.
- The foregoing description illustrates selected embodiments of the present invention. In light thereof variations and modifications will be suggested to one skilled in the art, all of which are within the scope of this invention.

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CLAIMS:

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1. A method for selecting a facial colour cosmetic scheme, the method comprising:

- (i) providing a computer module including a colour monitor screen and a spectrophotometer;
 - (ii) measuring a customer's facial colour with the spectrophotometer;
- (iii) transmitting information on the measured facial colour to the computer module for display of that colour on a model face generated on the monitor screen;
 - (iv) allowing the customer to select at least one area of the face to be coloured with a colour cosmetic product; and
 - (v) colouring the area of the model face with the selected colour.
- The method according to claim 1 further comprising the steps
 of printing in colour on paper the displayed model face via a printer.
 - 3. The method according to claim 1 or claim 2 wherein areas of the face to be coloured are those selected from the lips, eyelashes, eyelid, cheeks and combinations thereof.
 - 4. The method according to any of the preceding claims wherein a program operated by the computer module stores information on a vendor's products which will achieve the selected colour when placed upon the selected area of the face.
 - 5. A system for selecting a facial colour cosmetic scheme, the system comprising:

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- (i) a computer module connected with a colour monitor screen;
- (ii) a spectrophotometer for measuring skin colour;

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- (iii) a mechanism for transfer of facial colour data obtained from measurements with the spectrometer over to the computer module and transmission onto the monitor screen; and
- (iv) an interactive program displayed on the monitor allowing a customer to select at least one colour for application to an area of a model face appearing on the monitor.

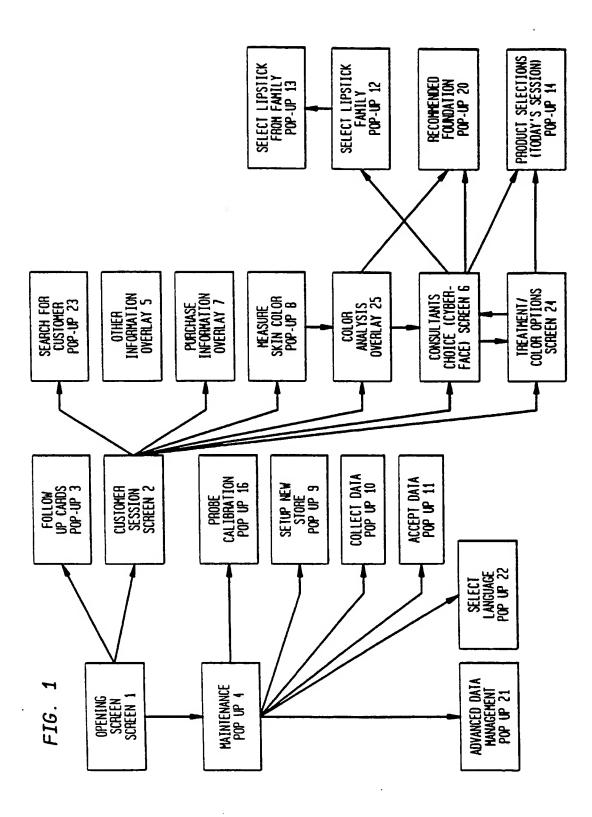


FIG. 2

Beauty * Name: Customer * Personal Information Name Last Name Address City State Zip Code Telephone Date of Birth Profession ◆ Regular Client ◆ Responds to Promotions	◇Verify Address and Cust Infol {SEARCH} {NEXT} {PREVIOUS} {CANCEL} {CLOSE} Day Month ◇Responds to Mailing
(Overlay area - not to scale)	[OTHER INFORMATION] [PURCHASE HISTORY] [PURCHASE INFORMATION] [PRODUCT OPTIONS] [HEASURE SKIN COLOR] [COLOR ANALYSIS] [SHOW COLOR]

FIG. 3

Customer fol	low up cards With clients information	n	
	List of Names	Information On Selected Customer	
		[] CALL COMPLETE [PRINT] [CLOSE]	

FIG. 4

MAINTENANCE

[CALIBRATE SKIN READER]
[LANGUAGE]
[SET UP NEW STORE]
[COLLECT DATA FOR MAIN OFFICE]
[ACCEPT DATA FROM LOCAL STORES]
[ADVANCED DATA MANAGEMENT]
[CLOSE]

FIG. 5

			OTHER INFOR	MATION		
Skin Typ	ę	Age Profile	Beauty Habits	Fragrance	Other Brands	
⊕ Sensit Normal to Normal to Dry Oily	o dry	15-20 20-30 30-40 40-50 50+	Make-up Cleanser/Toner Moisturizer Special Treat. Sunscreens Body Products	More than one	Biotherm Channel Clarins Clinique Dior Estee Lauder H. Rubenstein Lancaster	
	Spec Prefe	cial Preferent ers fragrance	ces of Needs: free products		Lancome Shiseido YSL Other	[Accept

FIG. 6

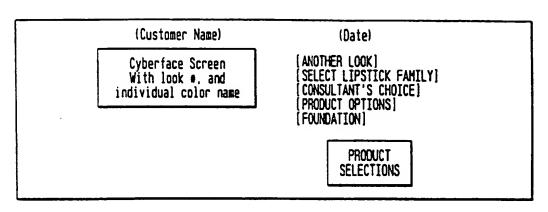


FIG. 7

	Purchase	Information	
Today	1	JANE DOE	٦
(1) Lipstick	125	Purchased	
(1) Hydrolight	Bisque	Recommended	
(1) Mousse	Bisque	Not Appropriate	[Recommended]
			[Purchase] _[Sample]
			Not Appropriate [Remove]
Date	905	JANE DOE	[USWOAS]
(2) Ceramide Complex		Sampled	
Today			」 ┐ .
Look 001	Plums	Recommended	-
Look 003	Reds	Recommended	
Look 004	Naturals	Recommended	

FIG. 8

		_			
ME	ASURE SKIN	WITH CO	LOR READER	1	
PRESS M	EASURE TO R	ECORD CO	LOR FROM	READER	
OR EI	NTER L. A.	8 VALUES	FROM REM	OTE	
	[= [= [=	A= A= A=	8= 8= 8=		
COLOR F	EADER IDEN	TIFICATI	ON:	•••••	
Fo	undation C	olor Mat	ch:	- [MEASURE] [ACCEPT] [CANCEL]	

FIG. 9

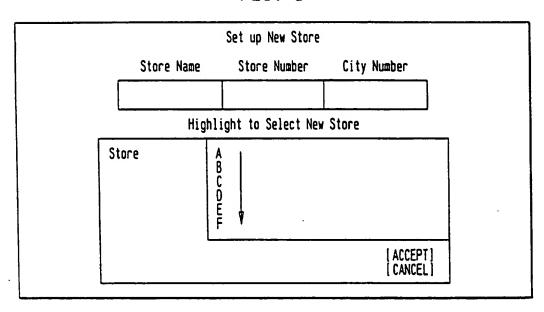


FIG. 10

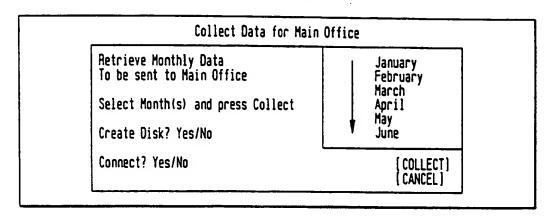


FIG. 11

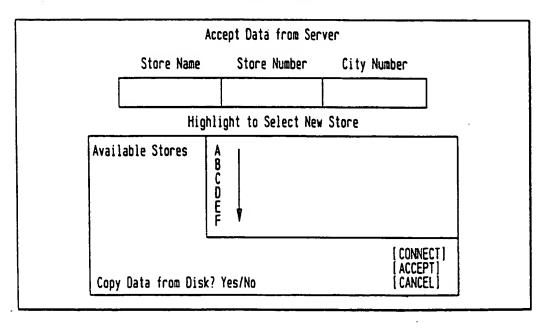


FIG. 12

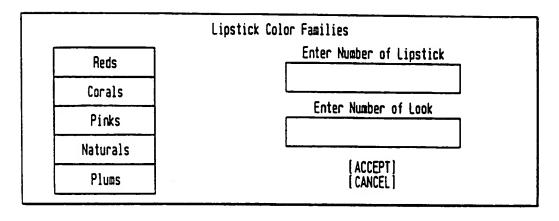


FIG. 13

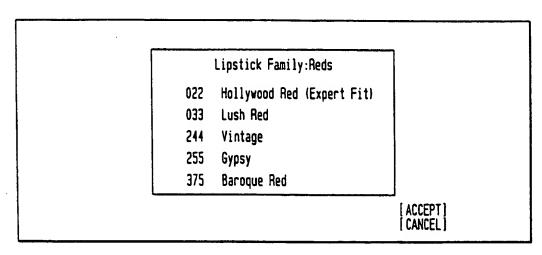


FIG. 14

	Today	y's Product Selections	
(*) Product Type ⊗ (1)Lipstick ⊗ (2)Hydrolight ⊗ (1)Mousse ⊗ Look 321 ⊗ Look 496	Color 121 Bisque Bisque Reds Plums	Recommended Purchased Recommended Recommended Recommended	[Recommended] [Purchase] [Sample] [Not Appropriate] [Remove] [Print] [Accept]

FIG. 15

Last purchase:	Date	Jane Doe
Total purchases:	2 (Last)	12 (Past Year)
SkinCare (3)		
⊗(4) Ceramide Capsules ⊗(3) Hillenium Cream ⊗(2) Perfection Cream	30 Jan 30 Nov 30 Nov	Purchased Purchased Purchased
Color (2)		
⊗(1) Flawless Finish (121) ⊗(1) Exceptional Lipstick (906)	30 Jan 30 Dec	Purchased Purchased
Fragrance (1)		
⊗(1) Sunflowers ⊗(1) Red Door	30 Oct 30 Sep	Purchased Purchased
Fragrance (1)		
⊗ Red Door ⊗ Exceptional Lipstick ⊗ Perfection Cream	30 Jan 30 Jan 30 Jan	Sampled Recommended Non-Appropriate

FIG. 16

			-		
Pop-up 19	Color Reading in Progress	Turn color reader off and Place Color Reader on the twice slowly on. Reader display should read Press (Enter) when ready! To record calibration color	Stop!	Probe calibrated. OK to continue?	Continue
Pop-up 18	Ready to Read Color Tile	Place Color Reader on the White Plate. Press (Enter) when ready!	4-6	בחופר	
Pop-up 17	Switch to Set Cal. Plate	Turn color reader off and on. Reader display should read	'Set Cal. Plate Press (Enter) when ready!	Cancel	Enter
Poo-uo 16	Probe Calibration		calibrated - Continue anyway? (Y or N)		

FIG. 17

Product	Color	
Mousse	234	[Recommend]
Hydrolight	123	[Purchase]
Pressed Powder	Medium 2	[Sample]
		[Accept]

FIG. 18

Update Doors Update Product List	Yes Yes	No No	
Export new Clients	Yes	No	[Import Update File [Create Update File
Clean returns database Delete entries more than	Yes 3 months	No	(Print Returns)
octore children more than	6 months 9 months 12 months		[Connect] [Close]

FIG. 19

	Language Selection	
	[English]	
	[Spanish]	
l	[French]	

FIG. 20

	Search for Customer	
Name:	·	
List of Names	Information On Selected Customer	
	[ACCEPT] [NEW CUSTOHER] [CANCEL]	

FIG. 21

Tro	eatment/Color	Product Options
Product	Color	[]Treatment []Color
Skin Illuminating Complex Millenium Night Millenium Energist		[]Fragrance [Recommend] [Purchase] [Sample]
Advertisement Video		{Not appropriate} [What's New}
		[ACCEPT] { Cancel]

FIG. 22

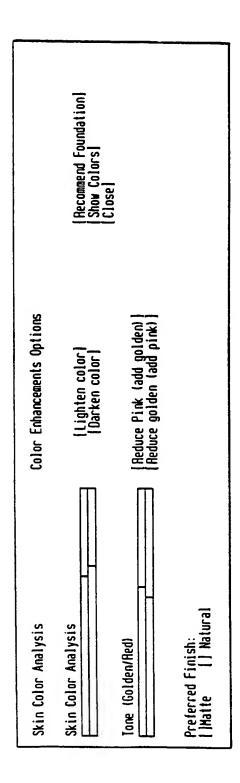
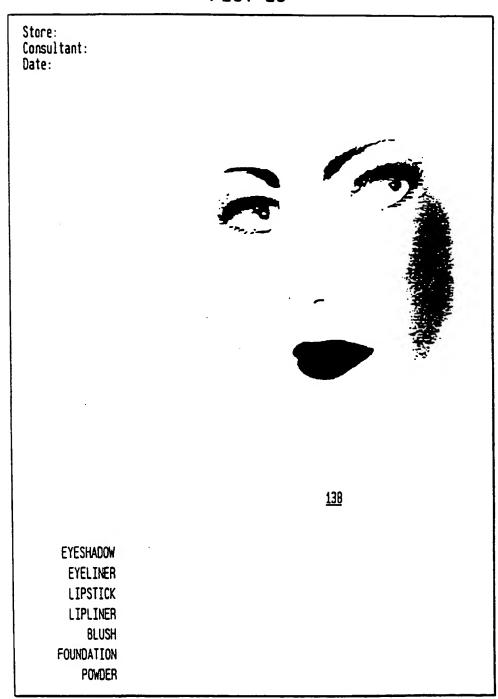


FIG. 23



INTERNATIONAL SEARCH REPORT

Inte. Jonal Application No

			101/61 00/	03407
	FICATION OF SUBJECT MATTER G06T11/00			
According to	o International Patent Classification (IPC) or to both national class	sification and IPC		
8. FIELDS	SEARCHED			
Minimum 90 IPC 7	cumentation searched (classification system tollowed by classifi G06T	cation symbols)		
Documentat	tion searched other than minimum documentation to the extent th	Nat such documents are inci	uded in the fields so	arched
	ata base consulted during the international search (name of data PO-Internal, WPI Data, IBM-TDB, IN		i, search terms used)
C. DOCUM	ENTS CONSIDERED TO BE RELEVANT			
Category '	Citation of document, with indication, where appropriate, of the	relevant passages		Relevant to claim No.
Y	EP 0 226 959 A (HORIKITA TSUKAS 1 July 1987 (1987-07-01) page 2, line 26 -page 3, line 3 page 8, line 39 - line 56; figu	3		1-3,5
Y	US 5 751 829 A (KUBO JON C ET 12 May 1998 (1998-05-12) abstract column 17, line 56 -column 18,	1-3,5		
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 10, 31 August 1999 (1999-08-31) & JP 11 143352 A (ONISHI NETSUC KOGYOSHO:KK), 28 May 1999 (1999) abstract			1-5
		-/		
		-,		
X Fur	ther documents are listed in the continuation of box C.	X Patent family	r members are listed	in annex.
"A" docum consi "E" earlier filling "L" docum which citatic "O" docum other "P" docum later	nent which may throw doubts on priority claim(s) or his cited to establish the publication date of another on or other special reason (as specified) ment referring to an oral disclosure, use, exhibition or reason ment published prior to the international filing date but than the priority date claimed	"T" later document published after the international filing date or promy date and not in conflict with the application but cited to understand the principle or theory underlying the invention." "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone. "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
	e actual completion of the international search 28 September 2000	Date of mailing of 05/10/2	f the international sec	arch report
	i mailing address of the ISA European Patent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Rijswrijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer		

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INTERNATIONAL SEARCH REPORT

Inti. donal Application No PCT/EP 00/05407

2 (0	MION) DOCUMENTS CONSIDERED TO BE RELEVANT	PCI/EP 00	
Category	Citation of document, with indication, where appropriate, of the relevant passages		Relevant to claim No.
Çali e goliy			NO.
A	US 5 495 338 A (GOURIOU ELIANE ET AL) 27 February 1996 (1996-02-27) column 2, line 37 - line 66		1
A	US 5 622 692 A (CASTRO JOHN R ET AL) 22 April 1997 (1997-04-22) cited in the application claims 1-3		1
A	US 5 478 238 A (BAUDET REGINE ET AL) 26 December 1995 (1995-12-26)		
A	FR 2 728 982 A (ROBIN JEAN MARC) 5 July 1996 (1996-07-05)		
A	WO 98 58351 A (WALLIN NICHOLAS JAMES; BRITISH TELECOMM (GB); MORTLOCK ANDREW NICH) 23 December 1998 (1998-12-23)		
	,		

INTERNATIONAL SEARCH REPORT

information on patent family members

PCT/EP 00/05407

Patent documer ated in search rep		Publication date	\$	Patent family member(s)		Publication date
EP 0226959	Α	01-07-1987	JP	62144280		27-06-1987
			CA	1261967	Α	26-09-1989
US 5751829	A	12-05-1998	NONE			
JP 1114335	2 A	28-05-1999	NONE			
US 5495338	Α	27-02-1996	FR	2690822		12-11-1993
			CA	2134985		11-11-1993
			DE	69301129		08-02-1996
			EP	0569291		10-11-1993
			EP	0646339		05-04-1995
			WO	9321794		11-11-1993
			J۲	7506504		20-07-1995
			DE	69301129		04-07-1996
			ES	2085734	·	01-06-1996
us 5622692	Α	22-04-1997	AU	697347	В	01-10-1998
			AU	7535794		21-03-1995
			CA	2168558		02-03-1995
			DE	69411924		27-08-1998
			DE	69411924	T	17-12-1998
			WO	9505892	Α	02-03-1995
			EP	0717657	Α	26-06-1996
			ES	2120065		16-10-1998
			JP	9502022		25-02-1997
			NZ	271658		24-11-1997
			ZA	9406410	Α	23-02-1996
US 5478238	Α	26-12-1995	EP	0638261		15-02-1995
			CA	2146134		09-02-1995
			DE	69301239		15-02-1996
			DE	69301239		14-08-1996
			ES	2085741		01-06-1996
			WO	9503727		09-02-1995
			JP	2986214		06-12-1999
			JP	8505078		04-06-1996
			US	5797750 		25-08-1998
FR 2728982	Α	05-07-1996	AU	4452296		24-07-1996
			WO	9621201	Α	11-07-1996
WO 9858351	A	23-12-1998	AU	8116498	Α	04-01-1999
	••		EP	0990224		05-04-2000
			GB	2341070		01-03-2000